

KNOW ALL ABOUT 

SOIL

the
PRECIOUS
EaRth!





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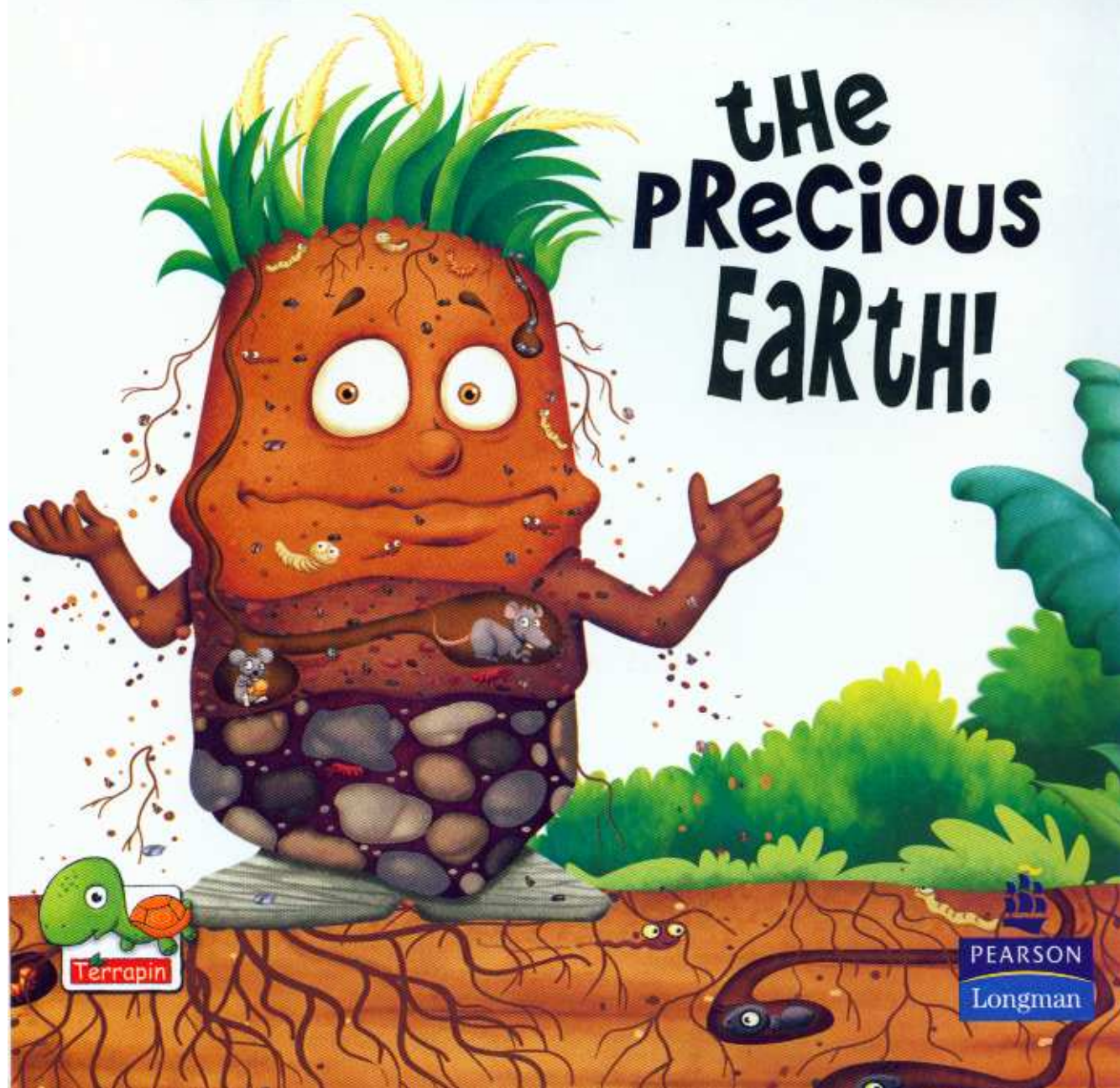
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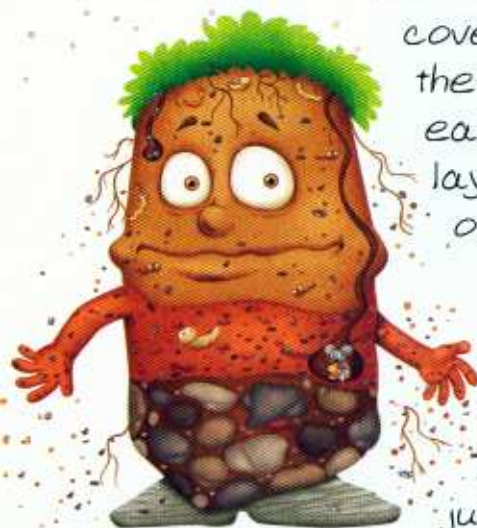
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SOIL

the
PReCious
EarTh!





Soil is the thin covering on the top of the earth—like a layer of butter or jam on a slice of bread. If you were a plant you would find it just as yummy!

WHAT IS SOIL?



Soil is made up of a lot of things. It is mainly made up of rocks and plant matter.

First, the rocky matter

To make soil, begin with broken up and powdered pieces of rock.

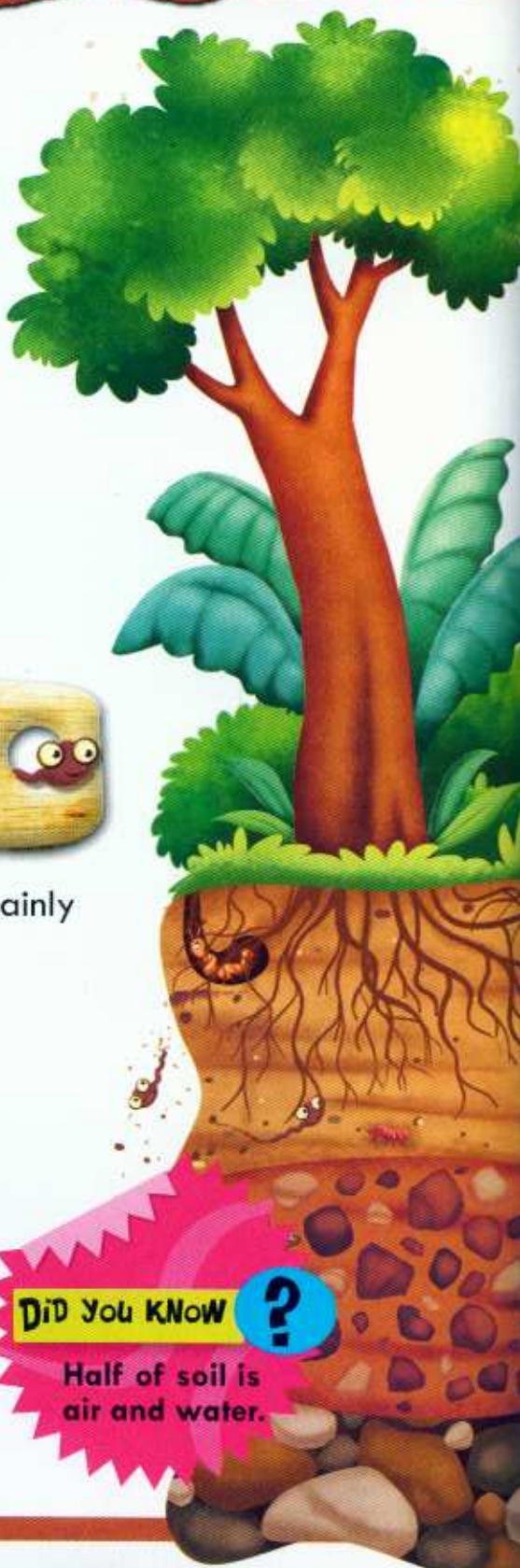
Next, the leafy matter

Parts of trees and plants mix up with the rocky matter. Don't forget the empty spaces within the soil. These spaces are called pores. Air and water flow through these pores.

DID YOU KNOW



Half of soil is air and water.



Is soil dirt? That pretty much depends on where it is. In the forest, it nourishes trees, but when you walk into your home with dirty shoes, it's dirt.

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Three parts of the earth are covered with water. The fourth part is land. Half of that is too dry or too cold or somehow not useful. The thin slice on top of the remaining half is all the useful soil we have.



Finally, the creepy crawlies

Now, bring in the creepy crawly worms that you can see and other tiny creatures that you can't see with your eyes. And that's all the stuff that comes together to form soil.



There are lots of secrets inside the soil. We need to be small to explore. We need to get down to little bug size. Really tiny!



Ground level

Lots of little bugs and creepy crawlies dig

around here. Leaves, twigs, and other plant parts lie rotting. These make the soil rich and help the plants grow.

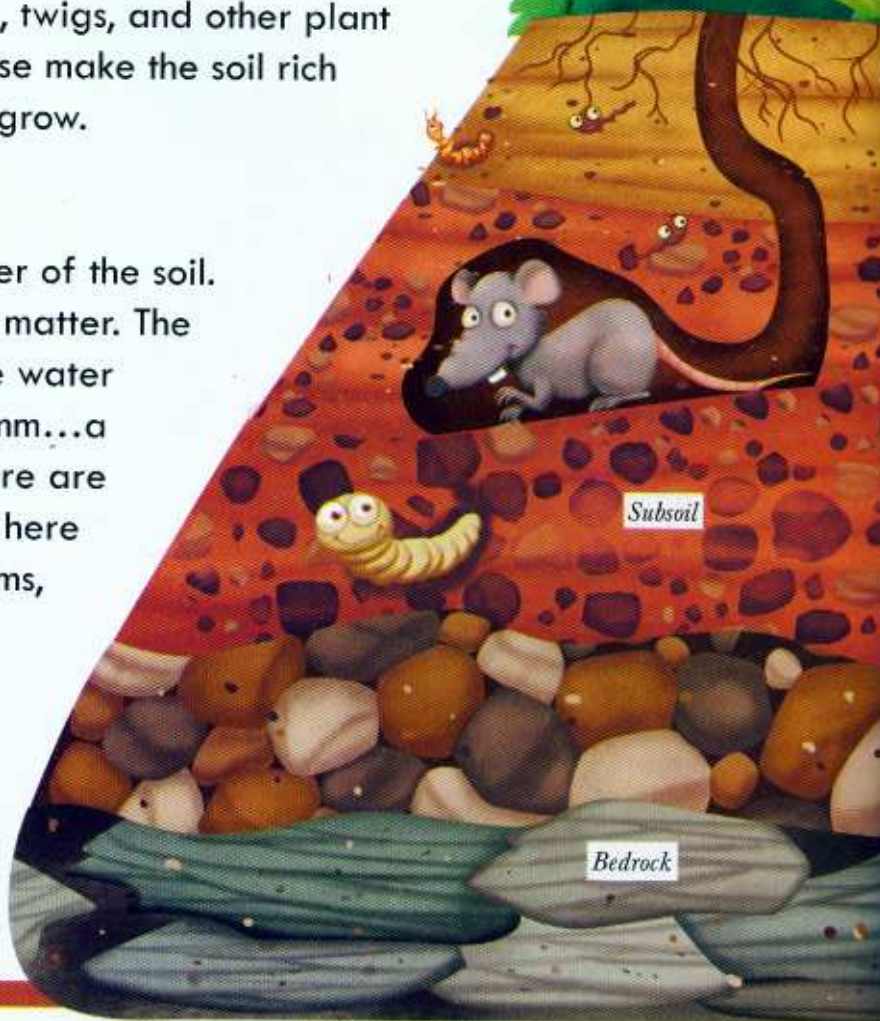


Topsoil

This is the upper layer of the soil. It has more of leafy matter. The plants love to sip the water from the pores. Mmmm...a refreshing drink! There are lots of soil creatures here like moles, earthworms, and mites.

Subsoil

There is more of rocky matter here, and less of leafy matter.



DIGGING DOWN UNDER

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LAYERS OF THE SOIL

Baby seeds sprout and their roots grow down, reaching out and drawing food for the plant.

DID YOU KNOW ?

Everyday some new soil forms from an uncovered piece of rock! Most of the soils of today are just a million year old or thereabouts. How many zeros is that??

Rock bottom

Whew! No leafy matter here. Only broken up pieces of rock! This is the regolith. It has the stuff that breaks down and forms the topsoil someday!

Bedrock

Ouch! We finally hit the hard bed of rock.

Topsoil

Regolith





Soil is formed by the breaking down of rocks into smaller particles. It is a slow process that could take a million years. The hot sun, the rain, and the cold weather help break down the bedrock, which becomes the parent material for soil.

HOW IS SOIL FORMED?



How does the parent material turn into soil?

Wind, rain, and snow all work together to break the rock into smaller pieces, called the parent material. That's a lot of hard work and takes a few thousand years.



Sometimes, an earthquake or a volcano can bring rocks from deep beneath the ground to the surface.

Rain, snow, and the heat of the sun break these rocks into smaller pieces and, finally, soil.



Some more ingredients

When parts of plants and trees fall on the ground, they also mix with the breaking rock. Now, tiny micro-organisms start work. They are little creatures we can't see with our eyes. They break down the rotting plant matter and mix it with the soil.

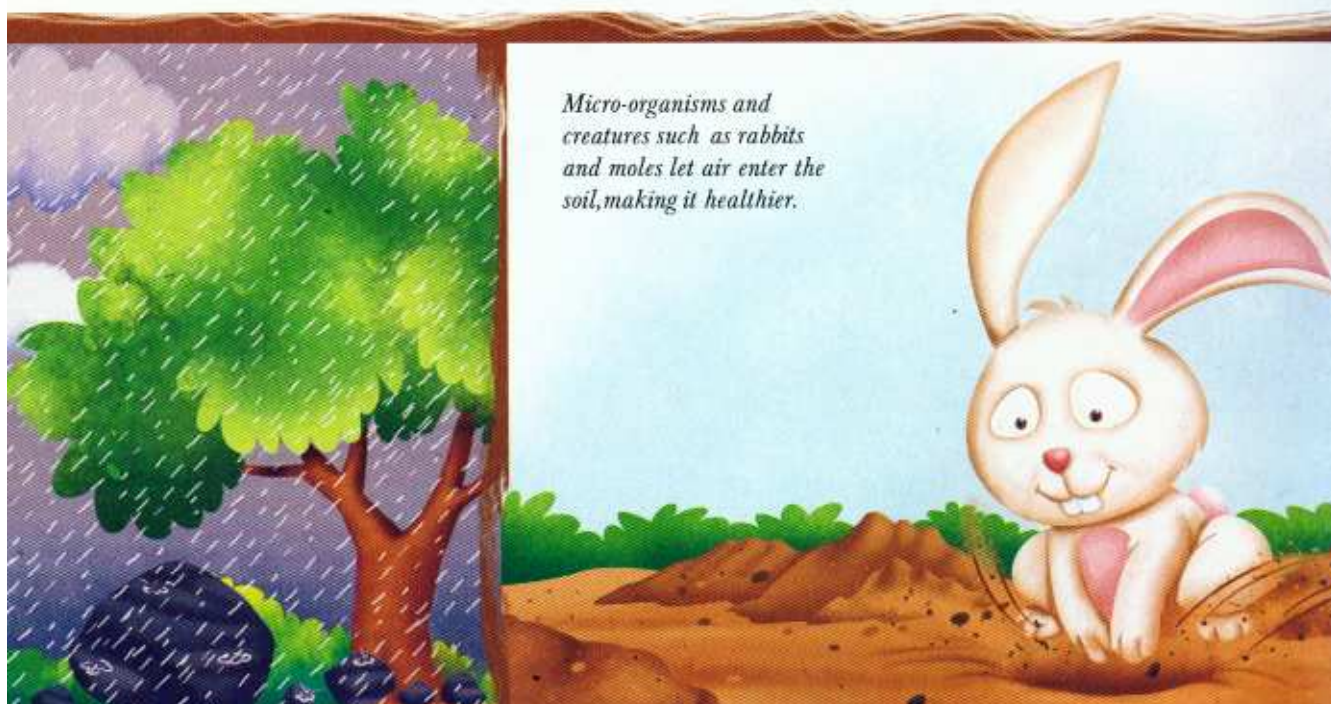
A few hundred years later, soil is ready!



Did You Know



Ten millimetres – that's probably just a little bigger than the length of your thumbnail – of soil can take between a hundred and a thousand years to form!



Micro-organisms and creatures such as rabbits and moles let air enter the soil, making it healthier.

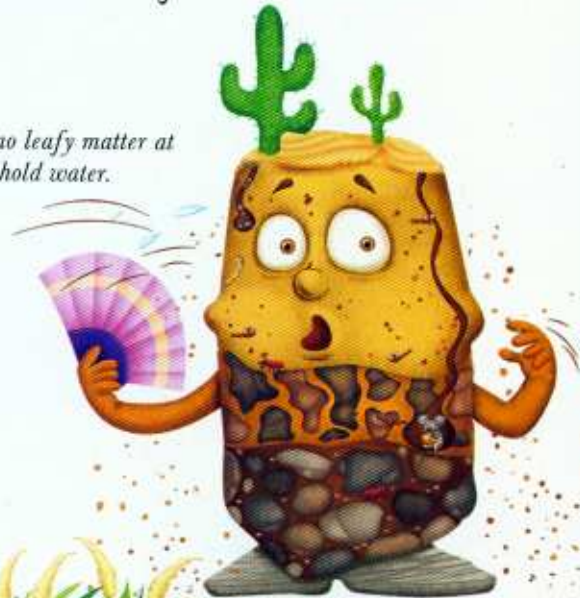
SOILS-THEY'RE DIFFER-



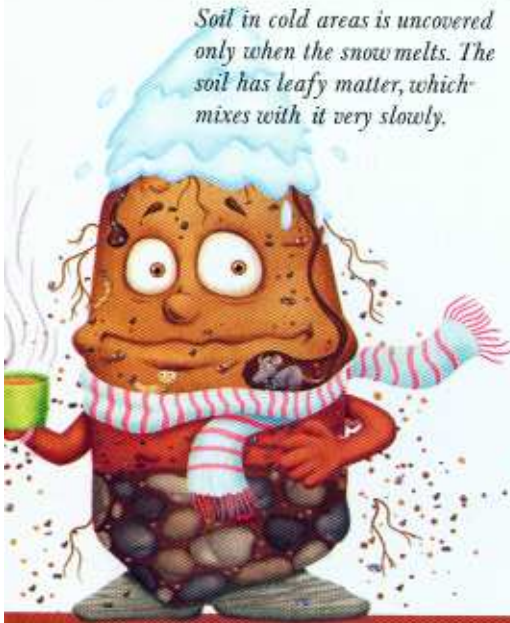
Forest soil has lots and lots of leafy matter, and so, it is blackish.

Soils are of different types. But how does one know the soils? Easy, just rub some soil between your fingers! That's the way to get introduced.

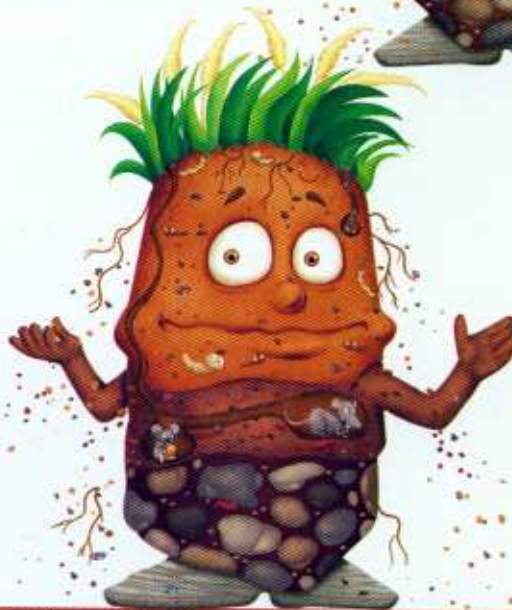
Desert soil has no leafy matter at all and cannot hold water.



Soil in cold areas is uncovered only when the snow melts. The soil has leafy matter, which mixes with it very slowly.



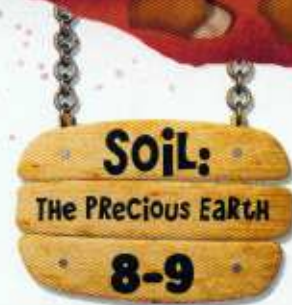
Soil in warm areas is the best for plants. Leafy matter is fully mixed with it, and it holds just the right amount of water for the plants.





Hi, I'm sandy soil!

Does the soil feel rough between your fingers? That's sandy soil. Water just runs through it. If you try to roll it into a ball it doesn't stick at all. Lots of it is lying around in the sand pit in the park.



Hi, I'm clayey soil!

Pick up this soil and it will feel as smooth as chocolate powder. Add water and it lumps together. Roll it into a ball and it sticks. You'll find this soil with the potter.



FUNNEE!



People put clay on their face to clean the little pores on their skin. It is called a 'face mask'. Clay is also used to make earthenware pots, which keep water cool.

Hello, I am silt!

Silt is a little like sand and a bit like clay. It is silky to touch and easy to roll into a ball when you add water to it. But it doesn't hold as tight as clay. Most plants grow well in silt.



From strawberries and ice cream to the delicious curries and breads, everything begins with soil. Many creatures call it home. Flowers and forests would disappear without soil.

Holding history

Soil holds secrets of people who lived long before us. It tells us how they lived and what plants they grew. Sometimes, we may also find things from long ago buried under the soil.

That's quite a lot of things that soil does for us, isn't it? Guess we need to really look after it.

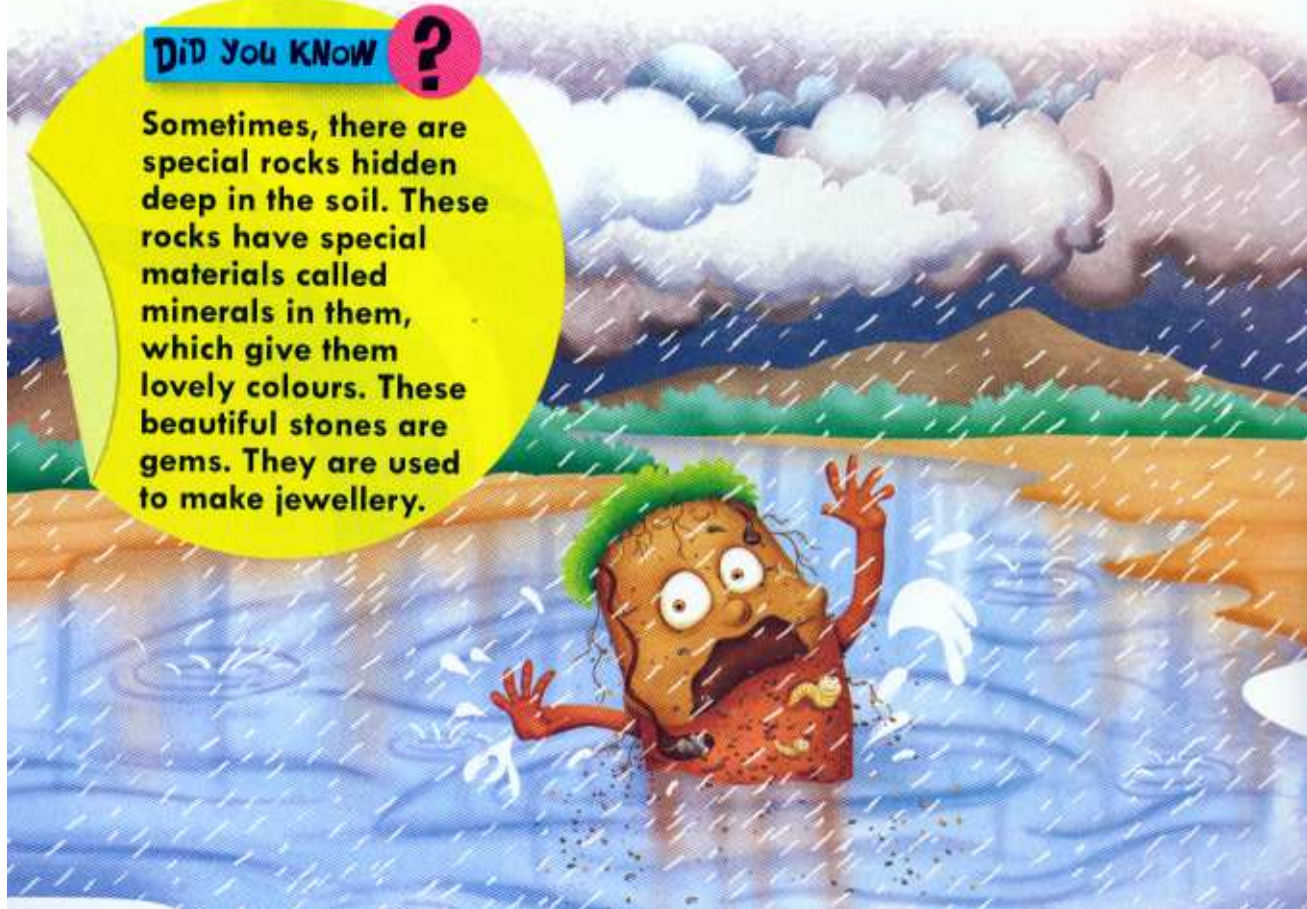


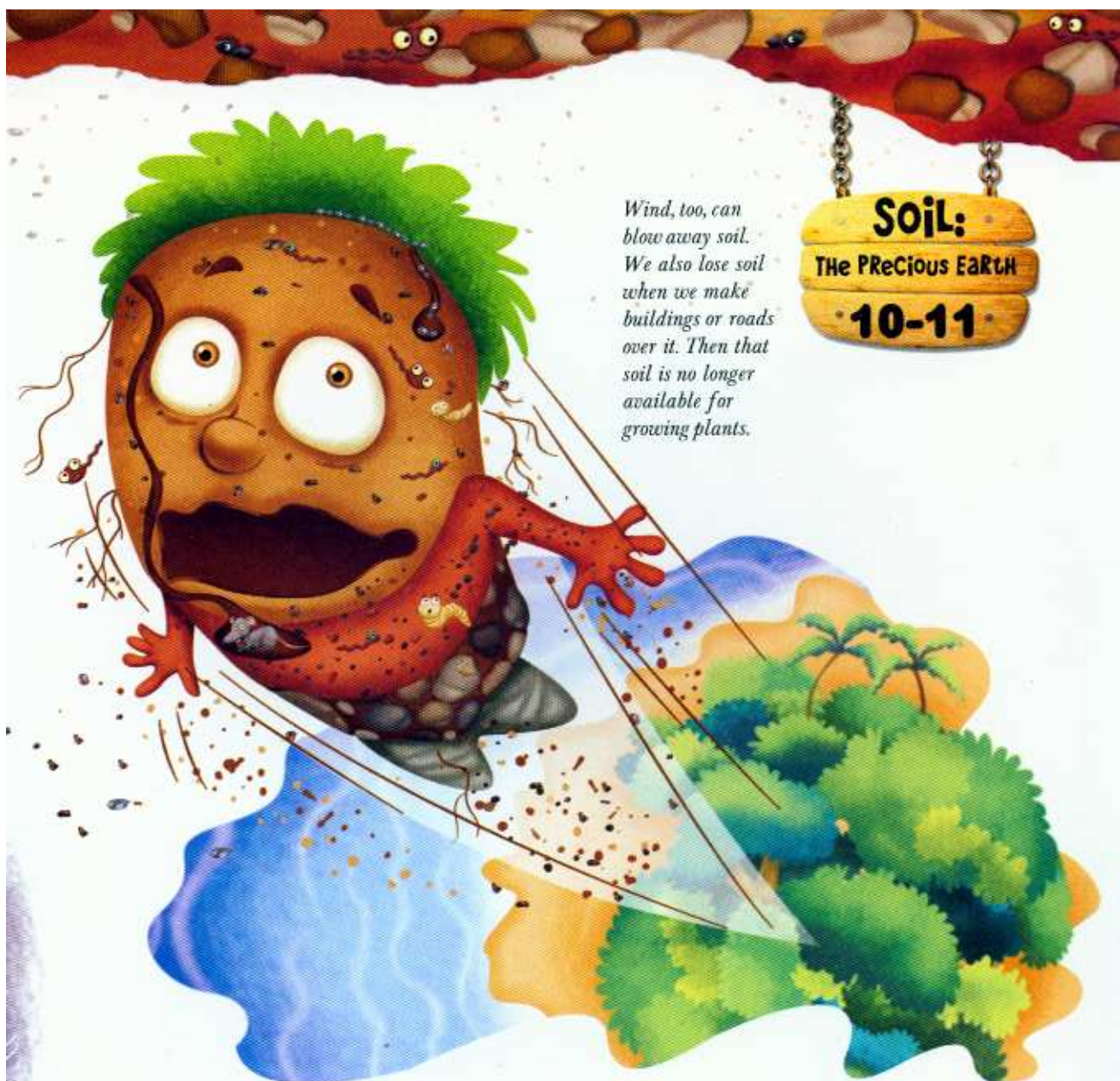
LOSING SOIL

In hillsides and mountains, heavy rain can wash off layers of good soil.

DID YOU KNOW ?

Sometimes, there are special rocks hidden deep in the soil. These rocks have special materials called minerals in them, which give them lovely colours. These beautiful stones are gems. They are used to make jewellery.





Can we lose soil?

Yes, very easily. If there is nothing to hold the soil in place, it erodes. That's the scientist's way of saying soil blows away or gets washed away.

Can we save it?

The best way to save the soil is to grow plants. The roots hold the soil. The plant covers the soil so that the wind finds it hard to blow it away.

SOIL CONSERVATION



Taking care of soil is called soil conservation. Soil takes thousands of years to form. If we do not look after soil, we will lose it in no time.



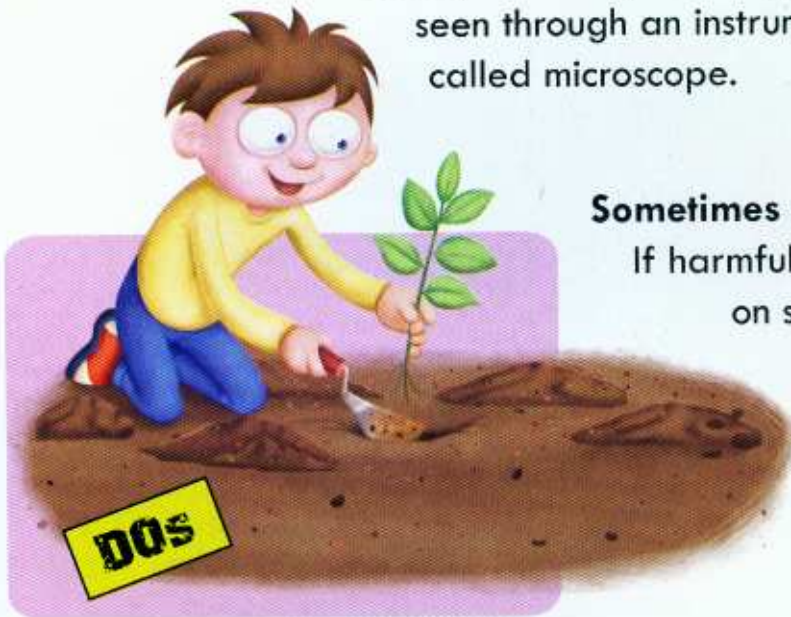
Scientists say that we lose twenty-five billion tonnes of soil every year. That much soil could fill a train of freight wagons long enough to encircle the earth 150 times!



A living being world

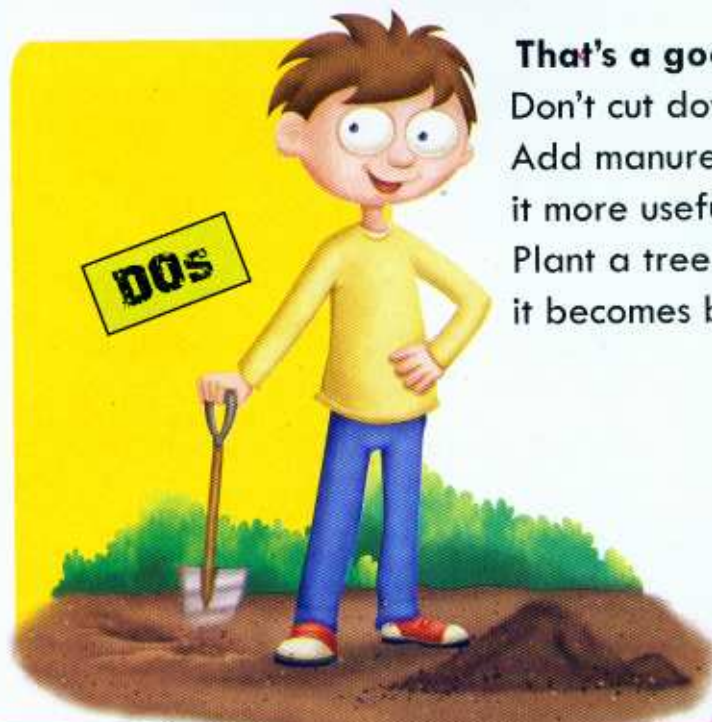
Millions of living plants and animals live in soil. Just think about all the soil creatures, big and small, that live, eat, move, and die in the soil! Some are so tiny that they can only be seen through an instrument called microscope.

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Sometimes soils go bad

If harmful waste is dumped on soil, it will kill all the little soil animals and plants. We cannot use this soil. All its good qualities are lost.



That's a good idea!

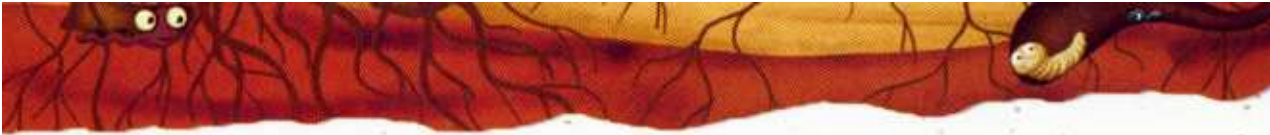
Don't cut down trees.

Add manure (plant food) to soil to make it more useful for plants.

Plant a tree or two and look after it till it becomes big and strong.

DID YOU KNOW ?

There are more living beings in a spoonful of healthy soil than there are people on this earth!



Next time you visit a forest, look at the ground. A dark brownish black crumbly stuff covers the forest floor. That's compost. It is a healthy snack for plants!

OF ROTTING LEAVES AND CREEPING WORMS!



Make a baby compost bin

Try making some compost. That way your plants will get lots of good food and you will recycle waste. Get an adult to join the fun.

1

Use an empty wooden box or tape a cardboard box carefully. Leave the top open for working. Line it with dry straw.



2

Place it in a dry, cool, open spot.

Collect as many of these as you can: leaves, twigs, some shredded newspapers, sawdust, grass, weeds, and kitchen scraps. Peels will do just fine.





Add to the carton till it is three-fourth full. Spread a layer of good soil. Sprinkle water to make it moist.



3

Let the micro-organisms in the soil start working.

Stir the stuff every week. If it is too dry, sprinkle water. But **DON'T** make it too wet.

4

Do you notice the stuff in the box changing?

After four weeks or so, you will find that all the stuff in the box has changed into compost.



Time to treat the plants!

Worming around

Want to improve the compost? Add some worms! Just remove any pins, sticky food labels, and things that may harm the worms.

5

DID YOU KNOW



Worms, like earthworms, feed on the grass and kitchen waste. That helps the compost form faster. As they move around in the soil, worms turn the soil and mix more air into it. The soil becomes even better.

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SOIL CRAWLERS CLUB

Welcome to the soil crawlers club. Some members have rather difficult names. It takes a while to get them right.

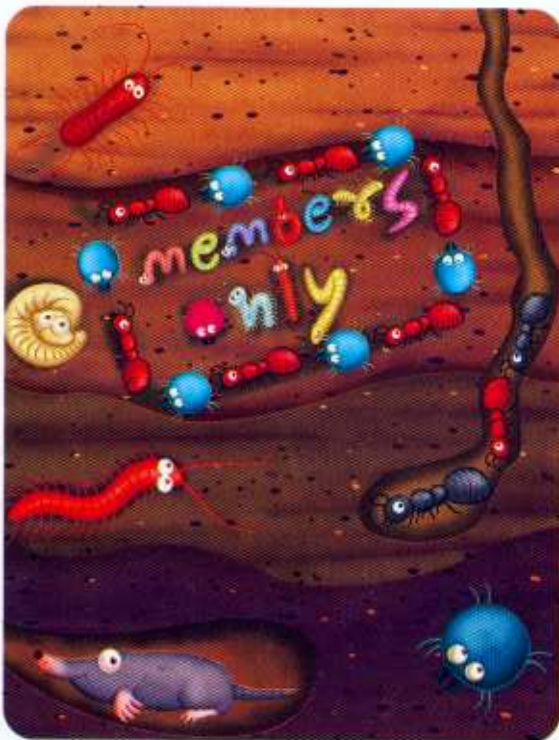
Earthworms: These toothless crawlers have some appetite! Leaves, peels, old food, even soil—anything to chomp! They make the soil healthier.

Nematodes: These round worms are different from the earthworms. They do a lot of good work but can sometimes make some plants sick.

Millipede: Don't mind its many, many legs. This timid vegetarian just loves leaves.

Centipede: This fast-moving many-legged creature loves to eat worms. No wonder many other members like to stay away from it.

Isopods: A cousin of the lobster, this grey-coloured creature loves to roll into a ball. Wheeeee!



Soil mites: They are very tiny, but they can eat a lot of rotting leaves and fungi.

Root fungi: These tiny plants help the roots of big plants gather food, and in return, the plants give them food. Sometimes, they trap nematodes too!

Ants: They move above and below the ground. Hard-working folks, they help move soil. They also love to nibble on any dead bugs and leftover food.

Rabbits, moles, ground squirrels, and badgers: Not really crawlers but they have the membership. That's because they love digging up soil, making burrows and moving underground.

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GREEN
BOOK

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SOIL

the PRECIOUS Earth!

Take a look at the ground beneath your feet. Looks still and silent, doesn't it? Don't be fooled...there's a lot happening down there. From tiny bug families taking a walk to roots of plants picking up food and drinks!

Read all about soil and why you need to look after it.

Other books in this series:

Sun: The Great Ball of Fire!

Wind: The Air in a Hurry!

Water: The Big Splash!

Space: The Great Beyond!

Earth: The Blue Marvel!

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